Relativistic Heavy Ion Collider
Magnet Division Specification

Spec. No.: RHIC-MAG-M-4360

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Class: Ancillary Specifications
Title: Weld Filler Metal For RHIC Magnets

- Prepared by: Signature on File
- Cognizant Engineer/Scientist: Signature on File
- Head, Production Engineering Section: Signature on File
- Q. A. Approval: Signature on File

REVISION RECORD

Rev. No.	Date	Page	Subject	Approval	QA
A	1/26/93		Initial Release.		

1. Scope:

This specification covers the requirements for weld filler metal to be used in cold mass containment applications in all superconducting cryogenic magnets for the Relativistic Heavy Ion Collider (RHIC) Project.

2. Applicable Documents:

The following documents form a part of this specification to the extent specified herein:

- ANSI/AWS A5.9-81 - Specification for Corrosion Resisting Chromium and Chromium-Nickel Steel Bare and Composite Metal Cored and Stranded Welding Electrodes and Welding Rods
- ANSI/AWS A5.01-87 - Filler Metal Procurement Guidelines
- BNL-QA-101 - Brookhaven National Laboratory Seller Quality Assurance Requirements

3. Requirements:

Filler metal shall conform to the requirements of this specification, ANSI/AWS A5.9-81, and ANSI/AWS A5.01-87. Requirements explicitly specified herein take precedence over those of the other documents.

3.1 Chemical Composition:

Filler metal shall be Type ER385L with Nitrogen and Manganese enhancement. Chemical composition requirements are as follows:

Element	Range (%)
Carbon	0.02 maximum
Chromium	20.9 - 21.7
Nickel	24.75 - 25.25
Molybdenum	4.75 - 5.25
Manganese	7.0 - 7.5
Silicon	0.2 - 0.5
Phosphorous	0.018 max (desired as low as possible)
Sulphur	0.004 max (desired as low as possible)
Nitrogen	0.17 - 0.21
Copper	1.25 - 1.75
Oxygen	0.015 max (desired as low as possible)

Analysis shall be made for the elements for which specific values are shown in this table. If, however, the presence of other elements is indicated in the course of routine analysis, further analysis shall be made to determine that the total of these other elements, except iron, is not present in excess of 0.50 percent.

3.2 Physical Characteristics:

A total of 20,000 lbs. of filler metal is to be supplied in the following form:

A.	.035" Diameter wire on standard 8" spools, 10-12 lbs. per spool:	10,000 lbs.
B.	.035" Diameter wire on standard 12" spools, 25 lbs. per spool:	7,000 lbs.
C.	1/16" Diameter x 36" long straight wire, flag tagged on one end:	3,000 lbs.

Lot classification: Class S1 (per ANSI/AWS A5.01 - 87)

3.3 Testing:

3.3.1 Level of testing: Schedule H (per ANSI/AWS A5.01 -87) (Chemical Analysis on each lot)

3.3.2 The Seller shall furnish Brookhaven National Laboratory with two pounds of finished filler wire from each heat prior to shipment. Brookhaven will independently verify acceptability of the material prior to releasing the wire for shipment.

4. Quality Assurance Provisions:

4.1 The Seller shall conform to the quality assurance requirements invoked by BNL-QA-101 (Brookhaven National Laboratory Seller Quality Assurance Requirements).

4.1.1 Per the General Requirements of BNL-QA-101 (paragraph 3.1.1), the Seller shall have and maintain an effective quality assurance program that will, as a minimum, comply with all of the requirements of MIL-Q-9858A.

4.1.2 The vendor shall comply with the following Special Requirements of BNL-QA-101:

Paragraph in BNL-QA-101

4.7 (Including 4.7.1)
4.16
4.23
4.24

5. Preparation for Delivery:

5.1 Release for Shipment: The Seller shall provide the Buyer with the actual chemical analysis of the filler metal prior to shipment of the material. In no event shall the Seller ship the filler metal without prior authorization from the Buyer in writing. In the event that material is shipped prior to such authorization, the Seller shall bear all additional costs this action may incur.

5.2 Marking/Identification Requirements: Each individual spool or box of wire shall be identified in accordance with paragraph 6.0 and/or 11.0 of ANSI/AWS A5.9-81.